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Personal Computer Version of the Process Model Projection Technique (PROMPT) (Version 3.0). User's Manual

Energy and Environmental Analysis, Inc.
Arlington, VA

Prepared for

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16. ABSTRACT The manual describes the use of the Process Model Projection Technique (PROMPT), one of four stationary source emission and control cost forecasting models developed by the EPA for the National Acid Precipitation Assessment Program (NAPAP). PROMPT projects air pollution emissions (sulfur dioxide, sulfates, and nitrogen oxides) and costs for industrial combustion and industrial processes; i.e., process heaters, furnaces, dryers, kilns, engines, turbines, and wood-fired boilers. PROMPT excludes the combustion of natural gas, distillate or residual fuel oil, and coal in industrial boilers. The outputs are provided for 1980 (baseline), 1985 (forecasted, not actual), 1990, 1995, 2000, 2010, 2020, and 2030. The manual is for Version 3.0 of PROMPT. It includes procedures and options for model operation on an IBM-AT or compatible personal computer. The model's operation is menu driven and relatively easy to use.

17. KEY WORDS AND DOCUMENT ANALYSIS

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Emission	Sulfates	Stationary Sources	14G
Cost Estimates	Industrial Processes		05A, 14A 13H
Forecasting	Combustion		21B
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USER'S MANUAL FOR THE PERSONAL COMPUTER VERSION OF THE PROCESS MODEL PROJECTION TECHNIQUE (VERSION 3.0)

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EPA Contracts 68-02-4202 (Task 10) and 68-02-4384 (Task 5)

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ABSTRACT

The Process Model Projection Technique (PROMPT) is one of four stationary source emission and control cost forecasting models developed by the Air and Energy Engineering Research Laboratory for the National Acid Precipitation Assessment Program (NAPAP). PROMPT projects air pollution emissions (sulfur dioxide, sulfates and nitrogen oxides) and costs for industrial combustion and industrial processes (i.e., process heaters, furnaces, dryers, kilns, engines, turbines and wood-fired boilers). PROMPT excludes the combustion of natural gas, distillate or residual fuel oil or coal in industrial boilers. The outputs are provided for 1980 (baseline), 1985 (forecasted, not actual), 1990, 1995, 2000, 2010, 2020 and 2030.

This document is a user's manual for Version 3.0 of PROMPT. It includes procedures and options for model operation.

The data sources used to develop PROMPT Version 3.0 predate the release of the final 1980 NAPAP Emissions Inventory. Compilation errors identified and corrected in these preliminary data prior to publication of the final inventory were not also corrected in the baseline data for Version 3.0. Instead, EPA has chosen to update the baseline emissions data in PROMPT using the more extensively quality assured 1985 NAPAP Emissions Inventory data base (now nearing completion). Version 3.0 of PROMPT has been tested to verify that its source code and algorithms are functioning as intended. The reader is cautioned to remain aware that the results obtained from this version of PROMPT are subject to change upon release by EPA of the next, updated version using the 1985 data baseline.

PROMPT is available on diskettes. For information, contact the National Technical Information Service (NTIS).

CONTENTS

		Page
Abstract		iii
Figures		vi
Tables		vi
1.	INTRODUCTION	1
	PURPOSE OF PROMPT	1
	OVERVIEW OF USER OPTIONS	1
2.	INSTALLATION OF THE PROMPT MODEL SOFTWARE	5
3.	PROCEUDRES FOR OPERATING THE PROMPT MODEL	7
4.	THE STANDARD MODEL OUTPUT TABLES	30
5.	RUN-TIME OPTIONS	33
	DEFAULT OPTIONS	35
6.	AIR POLLUTION CONTROL COST CURVES	36
7.	THE PROMPT INPUT DATA FILES	39
8.	POTENTIAL OPERATING PROBLEMS WITH THE PROMPT MODEL	40
APPENDIX A - SAMPLE OUTPUTS FROM PROMPT		41
APPENDIX B - ESTIMATES OF EMISSION RATES AND AIR POLLUTION CONTROL COSTS		52

FIGURES

Number		Page
1	PROMPT Model logic	2
2	Federal regions of the United States	31

TABLES

Number		Page
1	Record Layout of ESIM Formatted PROMPT Output	32

SECTION 1

INTRODUCTION

PURPOSE OF PROMPT

The Process Model Projection Technique (PROMPT) has been developed by Energy and Environmental Analysis, Inc. for the U.S. Environmental Protection Agency (EPA) in cooperation with the National Acid Precipitation Assessment Program (NAPAP). By design, it is a simple, low-cost model which will provide an initial assessment of the role and magnitude of industrial process emissions in the control of acid deposition SO_2/NO_x precursors.

PROMPT is designed to estimate future air emissions from industrial fuel combustion and industrial processes (i.e., process heaters, furnaces, dryers, kilns, engines, turbines and wood-fired boilers). PROMPT excludes the combustion of natural gas, distillate or residual fuel oil and coal in industrial boilers. Version 3.0 of PROMPT produces regional and state-level air emission projections (SO_2, primary sulfates, and NO_x) and incremental air pollution control costs. The outputs are provided for 1980 (baseline), 1985 (forecasted, not actual), 1990, 1995, 2000, 2010, 2020, and 2030.

OVERVIEW OF USER OPTIONS

PROMPT produces industrial air pollutant emissions forecasts from energy use projections generated by model runs of EEA's Industrial Sector Technology Use Model (ISTUM-2). The conceptual logic flow of the PROMPT Model is shown in Figure 1.

PROMPT will operate on one of the four fuel demand scenarios specified by the model operator. Three alternative scenarios are based on 1985 test cases produced by Argonne National Laboratory for NAPAP. These three available cases are:

- NAPAP 1985 Low Fuel Price/Economic Growth Rate
- NAPAP 1985 Reference (Moderate) Fuel Price/Economic Growth Rate
- NAPAP 1985 High Fuel Price/Economic Growth Rate

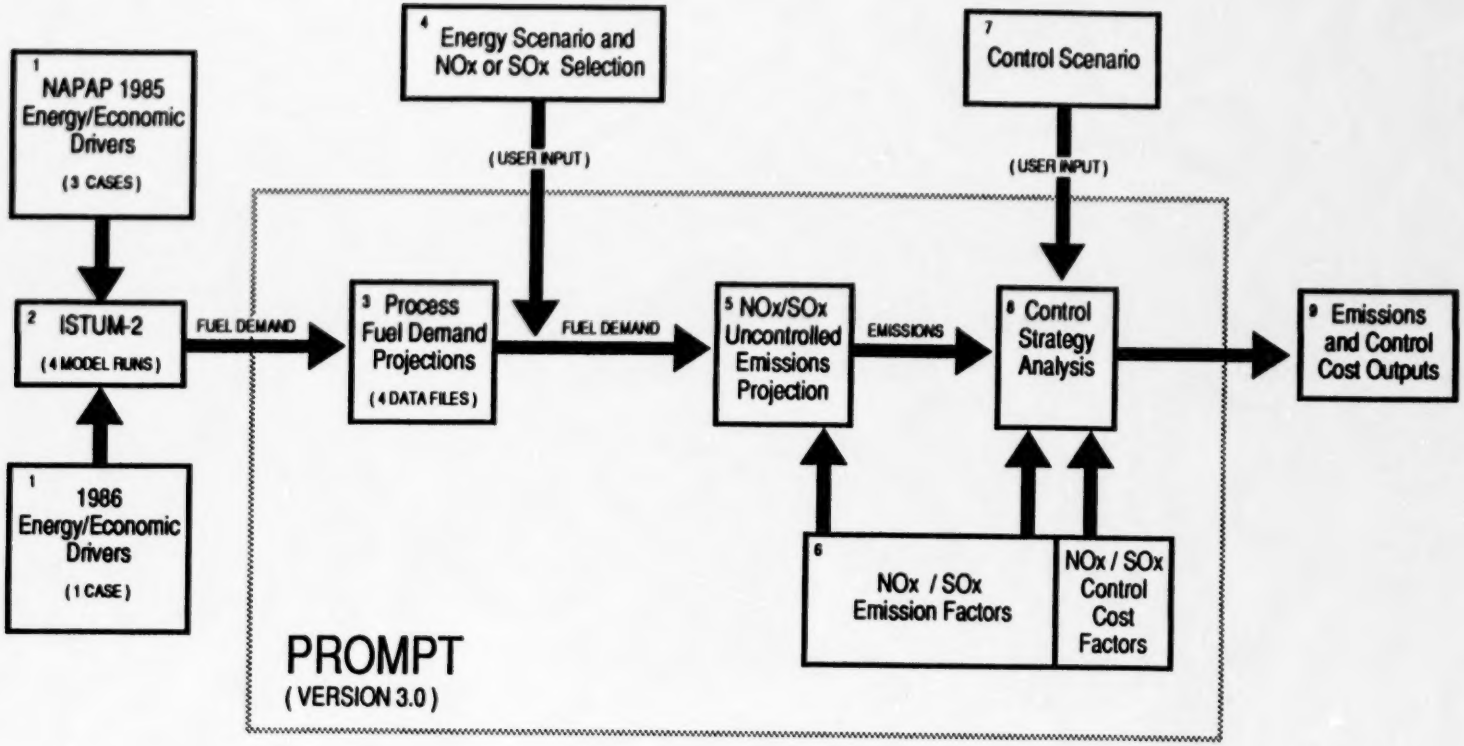

Figure 1. PROMPT Model logic.

The fourth case is based on the 1986 EEA middle oil price case and the NAPAP 1985 Low Economic Growth Rate scenario. The user may also edit these energy demand files.

The emissions and control cost module estimates controlled NO_x and SO_x emissions and allows the user to select alternative air pollution control strategies. The user may edit the emission rates and/or pollution control costs.

PROMPT will determine a least-cost solution for compliance with a selected air pollution control strategy and compute the resulting emissions reduction and incremental costs. When specifying a control strategy, the user is asked to choose:

- Whether the control strategy applies to new sources, existing sources, or both
- The type of control strategy (which can differ for new and existing sources)
- The year of implementation (which can also differ for new and existing sources)

The control strategy alternatives in PROMPT that can be applied to either NO_x or SO_x emissions are:

- A flat emissions limit (all sources meet a specified limit in lb/MMBtu)
- A uniform percent reduction (each emission source has to reduce uncontrolled emissions by a specified percentage)
- A specified cost-effectiveness (all control technologies having a cost-effectiveness of control less than a given CE ratio, $/lb, are adopted)
- An aggregate emissions reduction (total uncontrolled emissions are reduced by a specified amount per year or percentage, beginning with the most cost-effective, until the total reduction is reached).

PROMPT will forecast SO_2 and sulfate emissions or it will forecast NO_x emissions. It will not forecast emissions for all three pollutants in the same run. The NO_x emissions forecasts in PROMPT are not a function of sulfur emissions control strategies. Similarly, SO_2 and sulfate emissions forecasts in PROMPT are not a function of NO_x emissions control strategies.

Procedures for loading PROMPT on a personal computer are summarized in Section 2. Operating instructions are presented in Section 3 with an example. Section 4 outlines the three standard output tables; an example is presented in Appendix A. User options are described in Section 5. The air pollution control cost curves, which may be edited by model users, are explained in Section 6 and are summarized in Appendix B. Section 7 includes information about PROMPT's input files. Section 8 discusses potential operating problems.

SECTION 2

INSTALLATION OF THE PROMPT MODEL SOFTWARE

The PC version of the PROMPT model is distributed on four diskettes. The diskettes contain the model software, a complete set of input data files, and a batch file which will automatically load the model onto a hard disk.

The first step in installing the PROMPT model is to turn on the PC and wait for the C> prompt to appear. (Note: on some systems a menu appears instead of the C> prompt; in this case look for a menu option that will exit to DOS.)

When the prompt has appeared, place PROMPT distribution diskette number 1 in the A drive (if the system has two 1/2 height floppy drives the A drive is generally the one on top.) At the C> prompt type:

```
A:LOAD
```

This will execute a batch program on the A: drive. The program creates a directory called \PROMPT on the hard disk. It then copies the PROMPT model and all of the data files from the first distribution diskette into the \PROMPT directory. The user will then remove the first diskette and place the second and then the third distribution diskettes in drive A. When LOAD is complete it displays a message to the user and exits, leaving the PC in the \PROMPT directory.

To run the PROMPT model simply enter the following commands at the DOS C> prompt:

```
C>CD \PROMPT
C>RUNPRM
```

The CD (Change Directory) command places the PC in the PROMPT directory and the RUNPRM command starts the model.

The PROMPT Model is written in FORTRAN. In order to facilitate its use, the model source code has been compiled (on diskette number 1) and is ready to be run immediately. Furthermore, it is not necessary for the user to have any

knowledge of FORTRAN or of computer programming in order to use PROMPT successfully.

Diskette number 4 contains the FORTRAN source code. It is not necessary to load diskette number 4 on the PC hard disk in order to run PROMPT because the compiled source code is on diskette number 1.

SECTION 3

PROCEDURES FOR OPERATING THE PROMPT MODEL

Running the PROMPT model is a straight-forward process. By accepting the default options and using the data files provided with the PC version it is possible to produce a full set of output tables by typing two commands and selecting two menu options. Of course, the typical run is usually a little more complicated. In the course of conducting an emission control analysis PROMPT may be run several times. These runs will differ from one another in the options selected by the user at run-time and in the version of the energy demand data files used for each model run.

Once the computer has been turned on, two commands are necessary to execute PROMPT. The first is the DOS Change Directory command (CD) which is used to enter the PROMPT Directory. The second command, which actually begins the model run, is simply the command RUNPRM. The following pages show a transcript of a model run. User responses are underlined for clarity.

Transcript of a Sample PROMPT Model Run

```
C>CD \PROMPT
C>RUNPRM

                                PROMPT
                        VERSION 3.0 AS OF JULY 1988
        PROJECTIONS OF INDUSTRIAL NON-BOILER EMISSIONS AND CONTROL COSTS

                DEVELOPED FOR: U.S. ENVIRONMENTAL PROTECTION AGENCY

                                IN COOPERATION WITH
                THE NATIONAL ACID PRECIPITATION ASSESSMENT PROGRAM


                DEVELOPED BY: ENERGY AND ENVIRONMENTAL ANALYSIS, INC.
                                1655 N. FORT MYER DRIVE
                                ARLINGTON, VIRGINIA 22209
```

```
THE FOLLOWING ENERGY SCENARIOS ARE AVAILABLE:

    1  -  1985 NAPAP LOW
    2  -  1985 NAPAP REFERENCE
    3  -  1985 NAPAP HIGH
    4  -  1986 EEA MIDDLE
    5  -  PROGRAM STOP

WHICH SCENARIO WOULD YOU LIKE TO USE ? 1

                    LOADING DATA
```

```
                    *** OPTION SETTINGS ***
OPTION NUMBER          LABEL                  CURRENT VALUE

      1  -  GROWTH SCENARIO                   C
      2  -  POLICY CLASS CODE                 DD
      3  -  POLICY SEVERITY CODE              E
      4  -  SCENARIO LABEL                    ????????
      5  -  CONTROL FOCUS                     SOX CONTROL

            * EXISTING STOCK *
      6  -  STRATEGY                          UNIFORM % REDUCTION
      7  -  AMOUNT              20.0          PERCENT
      8  -  YEAR                              NO REGULATION

            * NEW STOCK *
      9  -  STRATEGY                          UNIFORM % REDUCTION
     10  -  AMOUNT              20.0          PERCENT
     11  -  YEAR                              NO REGULATION

     12  -  CHANGE COST AND/OR EMISSION RATE ESTIMATES
     13  -  CHANGE TOTAL FUEL DEMAND

     SELECT OPTION TO CHANGE (PRESS ENTER TO RUN) 4


ENTER NEW SCENARIO LABEL
  (UP TO 16 CHARACTERS)
LOW NOX
```

```
                    *** OPTION SETTINGS ***
OPTION NUMBER          LABEL                    CURRENT VALUE

      1  -  GROWTH SCENARIO                     C
      2  -  POLICY CLASS CODE                   DD
      3  -  POLICY SEVERITY CODE                E
      4  -  SCENARIO LABEL                      LOW NOX
      5  -  CONTROL FOCUS                       SOX CONTROL

            * EXISTING STOCK *
      6  -  STRATEGY                            UNIFORM % REDUCTION
      7  -  AMOUNT              20.0            PERCENT
      8  -  YEAR                                NO REGULATION

            * NEW STOCK *
      9  -  STRATEGY                            UNIFORM % REDUCTION
     10  -  AMOUNT              20.0            PERCENT
     11  -  YEAR                                NO REGULATION


     12  -  CHANGE COST AND/OR EMISSION RATE ESTIMATES
     13  -  CHANGE TOTAL FUEL DEMAND

     SELECT OPTION TO CHANGE (PRESS ENTER TO RUN) 5
```

```
POSSIBLE VALUES FOR CONTROL FOCUS

 1  -  NOX CONTROL
 2  -  SOX CONTROL
 3  -  NOX UNCONTROLLED
 4  -  SOX UNCONTROLLED

 P  -  PREVIOUS MENU
 M  -  MAIN MENU

ENTER SELECTION: 3
```

*** OPTION SETTINGS ***

OPTION NUMBER	LABEL	CURRENT VALUE
1 -	GROWTH SCENARIO	C
2 -	POLICY CLASS CODE	DD
3 -	POLICY SEVERITY CODE	E
4 -	SCENARIO LABEL	LOW NOX
5 -	CONTROL FOCUS	NOX UNCONTROLLED

(Note: Options 6 through 12 are suppressed here because the user has selected an uncontrolled case in Option 5)

13 - CHANGE TOTAL FUEL DEMAND

SELECT OPTION TO CHANGE (PRESS ENTER TO RUN) 5

```
POSSIBLE VALUES FOR CONTROL FOCUS

 1  -  NOX CONTROL
 2  -  SOX CONTROL
 3  -  NOX UNCONTROLLED
 4  -  SOX UNCONTROLLED

 P  -  PREVIOUS MENU
 M  -  MAIN MENU

ENTER SELECTION: 1
```

```
                    *** OPTION SETTINGS ***
OPTION NUMBER          LABEL                    CURRENT VALUE

     1  -  GROWTH SCENARIO                      C
     2  -  POLICY CLASS CODE                    DD
     3  -  POLICY SEVERITY CODE                 E
     4  -  SCENARIO LABEL                       LOW NOX
     5  -  CONTROL FOCUS                        NOX CONTROL

           * EXISTING STOCK *
     6  -  STRATEGY                             UNIFORM % REDUCTION
     7  -  AMOUNT                 20.0          PERCENT
     8  -  YEAR                                 NO REGULATION

           * NEW STOCK *
     9  -  STRATEGY                             UNIFORM % REDUCTION
    10  -  AMOUNT                 20.0          PERCENT
    11  -  YEAR                                 NO REGULATION

    12  -  CHANGE COST AND/OR EMISSION RATE ESTIMATES
    13  -  CHANGE TOTAL FUEL DEMAND

SELECT OPTION TO CHANGE (PRESS ENTER TO RUN) 6
```

```
                POSSIBLE VALUES FOR EXISTING STOCK

                 1  -  UNIFORM % REDUCTION
                 2  -  EMISSION RATE LIMIT
                 3  -  COST EFFECTIVENESS LIMIT
                 4  -  TOTAL SECTOR % REDUCTION
                 5  -  TOTAL SECTOR AMOUNT REDUCTION

                 P  -  PREVIOUS MENU
                 M  -  MAIN MENU

                ENTER SELECTION: 1

FOR EXISTING STOCK THE STRATEGY: UNIFORM % REDUCTION
  MAY RANGE FROM      .0 TO   99.0 PERCENT
PLEASE ENTER DESIRED VALUE 90


                POSSIBLE VALUES FOR EXISTING STOCK

                 1  -  NO REGULATION
                 2  -  BEGIN 1986
                 3  -  BEGIN 1991
                 4  -  BEGIN 1996

                 P  -  PREVIOUS MENU
                 M  -  MAIN MENU

                ENTER SELECTION: 4
```

```
                    *** OPTION SETTINGS ***
OPTION NUMBER          LABEL                    CURRENT VALUE

      1  -  GROWTH SCENARIO                     C
      2  -  POLICY CLASS CODE                   DD
      3  -  POLICY SEVERITY CODE                E
      4  -  SCENARIO LABEL                      LOW NOX
      5  -  CONTROL FOCUS                       NOX CONTROL

            * EXISTING STOCK *
      6  -  STRATEGY                            UNIFORM % REDUCTION
      7  -  AMOUNT                 90.0         PERCENT
      8  -  YEAR                                BEGIN 1996

            * NEW STOCK *
      9  -  STRATEGY                            UNIFORM % REDUCTION
     10  -  AMOUNT                 20.0         PERCENT
     11  -  YEAR                                NO REGULATION

     12  -  CHANGE COST AND/OR EMISSION RATE ESTIMATES
     13  -  CHANGE TOTAL FUEL DEMAND

     SELECT OPTION TO CHANGE (PRESS ENTER TO RUN) 9
```

```
                POSSIBLE VALUES FOR NEW STOCK

                 1  -  UNIFORM % REDUCTION
                 2  -  EMISSION RATE LIMIT
                 3  -  COST EFFECTIVENESS LIMIT
                 4  -  TOTAL SECTOR % REDUCTION
                 5  -  TOTAL SECTOR AMOUNT REDUCTION

                 P  -  PREVIOUS MENU
                 M  -  MAIN MENU

                ENTER SELECTION: 1

FOR      NEW STOCK THE STRATEGY: UNIFORM % REDUCTION
  MAY RANGE FROM     .0 TO   99.0 PERCENT
PLEASE ENTER DESIRED VALUE 90


                POSSIBLE VALUES FOR NEW STOCK

                 1  -  NO REGULATION
                 2  -  BEGIN 1986
                 3  -  BEGIN 1991
                 4  -  BEGIN 1996

                 P  -  PREVIOUS MENU
                 M  -  MAIN MENU

                ENTER SELECTION: 4
```

```
                    *** OPTION SETTINGS ***

OPTION NUMBER          LABEL                      CURRENT VALUE

      1  -  GROWTH SCENARIO                       C
      2  -  POLICY CLASS CODE                     DD
      3  -  POLICY SEVERITY CODE                  E
      4  -  SCENARIO LABEL                        LOW NOX
      5  -  CONTROL FOCUS                         NOX CONTROL

            * EXISTING STOCK *
      6  -  STRATEGY                             UNIFORM % REDUCTION
      7  -  AMOUNT                    90.0       PERCENT
      8  -  YEAR                                 BEGIN 1996

            * NEW STOCK *
      9  -  STRATEGY                             UNIFORM % REDUCTION
     10  -  AMOUNT                    90.0       PERCENT
     11  -  YEAR                                 BEGIN 1996

     12  -  CHANGE COST AND/OR EMISSION RATE ESTIMATES
     13  -  CHANGE TOTAL FUEL DEMAND

SELECT OPTION TO CHANGE (PRESS ENTER TO RUN) 12
```

```
POSSIBLE VALUES FOR GROUP
(CONTROL FOCUS: NOX CONTROL      )


 9  -  NOX HI TEMP RECUP
10  -  NOX LOW TEMP RECUP
11  -  NOX GLASS MELTING
12  -  NOX CEMENT
13  -  NOX TURBINES&ENGINES
15  -  NOX OTHERS

 P  -  PREVIOUS MENU
 M  -  MAIN MENU

ENTER SELECTION: 9


POSSIBLE VALUES FOR FUEL
(CONTROL FOCUS: NOX CONTROL        GROUP: NOX HI TEMP RECUP    )


 1  -  NATURAL GAS
 2  -  LOW SULFUR OIL
 6  -  DISTILLATE OIL

 P  -  PREVIOUS MENU
 M  -  MAIN MENU

ENTER SELECTION: 7


*** DATA FOR BIOMASS                          MAY NOT BE CHANGED ***
```

```
POSSIBLE VALUES FOR FUEL
(CONTROL FOCUS: NOX CONTROL        GROUP: NOX HI TEMP RECUP    )

  1  -  NATURAL GAS
  2  -  LOW SULFUR OIL
  6  -  DISTILLATE OIL

  P  -  PREVIOUS MENU
  M  -  MAIN MENU

ENTER SELECTION: 1


     CURRENT PARAMETER VALUES
GROUP: NOX HI TEMP RECUP   FUEL: NATURAL GAS

LEVEL     EMRT      RETANN    NEWANN    RETCAP    NEWCAP

  1       3.200     .000      .000      .000      .000
  2       2.240     .010      .004      .071      .028

  LEVEL 1 IS THE ESTIMATE OF THE UNCONTROLLED EMISSION RATE
```

```
POSSIBLE VALUES FOR LEVEL

 1  -  UNCONTROLLED EMISSIONS
 2  -  CONTROL LEVEL 1

 P  -  PREVIOUS MENU
 M  -  MAIN MENU

ENTER SELECTION: 2


POSSIBLE VALUES FOR PARAMETER

 1  -  EMRT
 2  -  RETANN
 3  -  NEWANN
 4  -  RETCAP
 5  -  NEWCAP

 P  -  PREVIOUS MENU
 M  -  MAIN MENU

ENTER SELECTION: 1

CURRENT VALUE FOR EMRT
   GROUP - NOX HI TEMP RECUP
    FUEL - NATURAL GAS
   LEVEL - CONTROL LEVEL 1
   IS:   2.24000

ENTER NEW VALUE 2.3

VALUE CHANGED - ENTER NEXT SELECTION
```

```
POSSIBLE VALUES FOR PARAMETER

 1  -  EMRT
 2  -  RETANN
 3  -  NEWANN
 4  -  RETCAP
 5  -  NEWCAP

 P  -  PREVIOUS MENU
 M  -  MAIN MENU

ENTER SELECTION: P


     CURRENT PARAMETER VALUES
GROUP: NOX HI TEMP RECUP   FUEL: NATURAL GAS

LEVEL     EMRT      RETANN    NEWANN    RETCAP    NEWCAP

  1       3.200     .000      .000      .000      .000
  2       2.300     .010      .004      .071      .028

   LEVEL 1 IS THE ESTIMATE OF THE UNCONTROLLED EMISSION RATE


   POSSIBLE VALUES FOR LEVEL

    1  -  UNCONTROLLED EMISSIONS
    2  -  CONTROL LEVEL 1

    P  -  PREVIOUS MENU
    M  -  MAIN MENU

   ENTER SELECTION: M
```

```
                    *** OPTION SETTINGS ***
OPTION NUMBER          LABEL                    CURRENT VALUE

      1  -  GROWTH SCENARIO                     C
      2  -  POLICY CLASS CODE                   DD
      3  -  POLICY SEVERITY CODE                E
      4  -  SCENARIO LABEL                      LOW NOX
      5  -  CONTROL FOCUS                       NOX CONTROL

            * EXISTING STOCK *
      6  -  STRATEGY                            UNIFORM % REDUCTION
      7  -  AMOUNT              90.0            PERCENT
      8  -  YEAR                                BEGIN 1996

            * NEW STOCK *
      9  -  STRATEGY                            UNIFORM % REDUCTION
     10  -  AMOUNT              90.0            PERCENT
     11  -  YEAR                                BEGIN 1996

     12  -  CHANGE COST AND/OR EMISSION RATE ESTIMATES
     13  -  CHANGE TOTAL FUEL DEMAND

SELECT OPTION TO CHANGE (PRESS ENTER TO RUN) 13
```

```
POSSIBLE VALUES FOR GROUP
(CONTROL FOCUS: NOX CONTROL      )


 9  -  NOX HI TEMP RECUP
10  -  NOX LOW TEMP RECUP
11  -  NOX GLASS MELTING
12  -  NOX CEMENT
13  -  NOX TURBINES&ENGINES
14  -  NOX FBC HEATERS
15  -  NOX OTHERS

 P  -  PREVIOUS MENU
 M  -  MAIN MENU

ENTER SELECTION: 15


POSSIBLE VALUES FOR YEAR

 1  -  1985
 2  -  1990
 3  -  1995
 4  -  2000
 5  -  2010
 6  -  2020
 7  -  2030

 P  -  PREVIOUS MENU
 M  -  MAIN MENU

ENTER SELECTION: 1
```

```
 POSSIBLE VALUES FOR REGION

  1  -  NEW ENGLAND
  2  -  NEW YORK/NEW JERSEY
  3  -  MIDDLE ATLANTIC
  4  -  SOUTH ATLANTIC
  5  -  MIDWEST
  6  -  SOUTH WEST
  7  -  CENTRAL
  8  -  NORTH CENTRAL
  9  -  WEST
 10  -  NORTH WEST

  P  -  PREVIOUS MENU
  M  -  MAIN MENU

 ENTER SELECTION: 2



 CURRENT ENERGY PROJECTION FOR:
     GROUP - NOX OTHERS
    REGION - NEW YORK/NEW JERSEY
      YEAR - 1985
     IS:  0.371131E+09 (MILLION BTUS)
 ENTER REVISED VALUE: 0.371131E+09

 VALUE CHANGED - ENTER NEXT SELECTION
```

```
POSSIBLE VALUES FOR REGION

 1  -  NEW ENGLAND
 2  -  NEW YORK/NEW JERSEY
 3  -  MIDDLE ATLANTIC
 4  -  SOUTH ATLANTIC
 5  -  MIDWEST
 6  -  SOUTH WEST
 7  -  CENTRAL
 8  -  NORTH CENTRAL
 9  -  WEST
10  -  NORTH WEST

 P  -  PREVIOUS MENU
 M  -  MAIN MENU

ENTER SELECTION: M
```

```
                    *** OPTION SETTINGS ***
OPTION NUMBER          LABEL                    CURRENT VALUE

      1  -  GROWTH SCENARIO                     C
      2  -  POLICY CLASS CODE                   DD
      3  -  POLICY SEVERITY CODE                E
      4  -  SCENARIO LABEL                      LOW NOX
      5  -  CONTROL FOCUS                       NOX CONTROL

            * EXISTING STOCK *
      6  -  STRATEGY                            UNIFORM % REDUCTION
      7  -  AMOUNT              90.0            PERCENT
      8  -  YEAR                                BEGIN 1996

            * NEW STOCK *
      9  -  STRATEGY                            UNIFORM % REDUCTION
     10  -  AMOUNT              90.0            PERCENT
     11  -  YEAR                                BEGIN 1996

     12  -  CHANGE COST AND/OR EMISSION RATE ESTIMATES
     13  -  CHANGE TOTAL FUEL DEMAND

SELECT OPTION TO CHANGE (PRESS ENTER TO RUN) enter
```

Transcript of a Sample PROMPT Model Run (Continued)

```
PROCESSING 1980 ...
PROCESSING 1985 ...
PROCESSING 1990 ...
PROCESSING 1995 ...
PROCESSING 2000 ...
PROCESSING 2010 ...
PROCESSING 2020 ...
PROCESSING 2030 ...


          RUN COMPLETE

          REGIONAL EMISSIONS DATA ARE IN OUTEMISR.DAT

          STATE-LEVEL COST AND EMISSIONS DATA ARE IN OUTESIM.DAT
```

SECTION 4

THE STANDARD MODEL OUTPUT TABLES

A full run of PROMPT will produce three output files:

OUTEMISR.DAT - Contains the regional (ten Federal regions, see Figure 2) emission projections by emissions source group; an example of this table is shown in Appendix A.

OUTESIM.DAT - Contains cost and emissions projections by state for EPA's Emissions Strategy Integration Model (ESIM). The data elements and their formats are listed in Table 1.

OUTSUM.DAT - Contains unformatted regional emissions projections by emissions source group and fuel type.

To obtain a printed copy of one of these files use the TYPE command. For example, the following command will print a copy of the regional emissions output tables:

```
C>TYPE OUTEMISR.DAT > PRN
```

The version of OUTEMISR.DAT file created by the PROMPT Model sample run described in Section 3 is presented in Appendix A.

OUTESIM.DAT does not include the SO_2 and sulfate emissions forecasts for smelters and sulfur processing plants. The SO_2 and sulfate emissions forecasts for these two emission source groups in PROMPT are exogenous assumptions.

If you are making multiple model runs and you wish to save the output files from each run, the output files need to be renamed before the next model run is executed. Otherwise, the output files from the second model run will replace the output files from the first model run.

Figure 2. Federal regions of the United States.

TABLE 1. RECORD LAYOUT OF ESIM FORMATTED PROMPT OUTPUT

Columns	Format	Contents	Example
1	A1	Global economic/growth scenario code	M, L, H
2-5	I4	Case Year	1995
6-7	A2	State FIPS	OH, TX
8	A1	Source sector code	E, B
9-10	A2	Policy class code	SC
11	A2	Policy severity code	1, 2, A, B
12	A1	Primary pollutant label	S, T, N
13-18	F6.0	Primary pollutant emissions (KTons)	
19	A1	Second pollutant label	S, T, N
20-25	F6.0	Second pollutant emissions (KTons)	
26-39	A14	Blank	
40-47	F8.2	Total annualized cost for control strategy in millions of 1980 dollars	
48-55	F8.2	Total cumulative capital investment for the control strategy, in millions of 1980 dollars	
56-63	F8.2	Total annual operating and maintenance costs for case year, (fixed and variable) excluding fuel or fuel related penalties, in real 1980 dollars	

SECTION 5

RUN-TIME OPTIONS

The PROMPT Model allows the user to specify emissions control strategies at run time. The options are shown here in the order in which they appear on the main menu. Each option has a default value which the user is free to accept or modify. Options may be changed any number of times before the run is actually made.

- OPTION 1 - GROWTH SCENARIO: This may be any alphabetic character from A to Z. The label will be printed in the output file OUTESIM.DAT.
- OPTION 2 - POLICY CLASS CODE: This option is not range checked; PROMPT will accept any one or two character response. A longer response will be truncated to two characters. The label will be printed in the output file OUTESIM.DAT.
- OPTION 3 - POLICY SEVERITY CODE: This may be any alphanumeric character in the range from A to Z or 1 to 9. The label will be printed in the output file OUTESIM.DAT.
- OPTION 4 - SCENARIO LABEL: A label entered by the user may consist of up to 16 alphanumeric characters. The label will be printed on the output report in OUTEMISR.DAT.
- OPTION 5 - CONTROL FOCUS: There are four options:
  1 - NOX CONTROL
  2 - SOX CONTROL
  3 - NOX UNCONTROLLED
  4 - SOX UNCONTROLLED

Note: if either of the UNCONTROLLED cases are selected, main menu OPTIONS 6 through 12 will not appear as they apply only to controlled cases. If OPTION 5 is re-selected and one of the controlled cases is chosen, the main menu options will re-appear.

- OPTION 6 - STRATEGY (EXISTING STOCK): There are five options:
  1 - UNIFORM % REDUCTION
  2 - EMISSION RATE LIMIT
  3 - COST-EFFECTIVENESS LIMIT
  4 - TOTAL SECTOR % REDUCTION
  5 - TOTAL SECTOR AMOUNT REDUCTION

- OPTION 7 - AMOUNT (EXISTING STOCK): The user will be prompted for an amount to be associated with the strategy option selected through OPTION 6 (STRATEGY). The units are PERCENT, LB/MILLION BTU, DOLLARS/LB, PERCENT, AND MILLIONS POUNDS (per year) respectively for the five strategies. PROMPT will reject out of range values, print the acceptable range as an aid to the user, and request that a new value be entered.

- OPTION 8 - YEAR (EXISTING STOCK): There are four options:
  1 - NO REGULATION
  2 - BEGIN 1986
  3 - BEGIN 1991
  4 - BEGIN 1996

  The NO REGULATION option prevents any control strategy from being implemented. This value is automatically selected if either of the UNCONTROLLED cases are selected under OPTION 5 (CONTROL FOCUS). The other three options specify years for beginning the new control strategy.

- OPTIONS 9-11: Identical to OPTIONS 6-8 except that they affect New Stock instead of Existing Stock.

- OPTION 12 - CHANGE COST AND/OR EMISSION RATE ESTIMATES: Allows the user to modify the cost and emission rate data for any emission source group and fuel type (reference Section 6).

- OPTION 13 - CHANGE TOTAL FUEL DEMAND: Allows the user to change the fuel demand projection for any emission source group, year, and Federal region of country.

Default Options

The default options shown at the beginning of the PROMPT run are stored in a data file named RUNOPTS.DAT. By editing this file it is possible to change the default options used by the model. In general, this is not necessary; however, if certain options are always going to be reset to a particular value it may be worthwhile to modify the default. The options in the file are labeled, and the acceptable responses are identical to those used by the run-time menu system.

SECTION 6

AIR POLLUTION CONTROL COST CURVES

The air pollution control cost curves in the PROMPT Model are actually step functions which relate annualized pollution control costs to controlled emission rates (lb/MMBtu). These functions are based on limited data and many simplifying assumptions. The model operator has the option to change these estimates prior to executing a model run.

Not every emission source group in the PROMPT Model has pollution control cost options. The SO_x emission source groups without pollution control options include:

- Smelters and sulfur processing (emissions are an exogenous assumption)
- Coke ovens and pulp liquor recovery (which have relatively low SO_x emission rates)
- Iron ore agglomeration

The only NO_x emission source group without a pollution control option is FBC heaters (which have a relatively low NO_x emission rate).

Some emission source groups have pollution control options on some fuel types (those with relatively high uncontrolled emission rates) but not on other fuel types (those with relatively low emission rates or the fuel type is not applicable or control methods have not been commercially applied). In some cases, the step function is defined as a single step; in other cases, the step function may be estimated with 2-5 steps.

The model operator may revise these step functions, subject to several conditions:

- Pollution control options must already exist in the current PROMPT Model Version 3 (the user may not add options to address smelters, sulfur processing, coke ovens, pulp liquor recovery, iron ore agglomeration, or FBC heaters; the user may not add pollution control options to fuel types for other emission source groups which do not currently have options).
- SO_x pollution control cost curves may not be revised when the user is running the model to generate NO_x emissions and vice versa.
- Revisions to control cost curves are temporary substitutions for the next model run (they are NOT permanent file modifications).

- The user may not add more steps to the existing step function.
- The user may effectively reduce the number of steps of a certain step function by setting the values of the third step, for example, to be equal to the parameter value of the second step.
- The cost estimates for each step are independent of the cost estimates for any other step.

Each step function is defined by six parameters:

- L - Level (integer 1-6)
- EMRT - Emission rate (lb/MMBtu)
- RETANN - Retrofit total annualized cost (1980$/MMBtu of annual fuel demand)
- NEWANN - New unit total annualized cost (1980$/MMBtu of annual fuel demand)
- RETCAP - Retrofit total capital cost (1980$/MMBtu of annual fuel demand)
- NEWCAP - New unit total capital cost (1980$/MMBtu of annual fuel demand)

The level is the number of the step. When L is 1, the value for EMRT is the estimate of the uncontrolled emission rate and RETANN=NEWANN=RETCAP=NEWCAP=0. When L is greater than 1, the value for EMRT is the estimated controlled emission rate.

The cost estimates include pollution control costs only:

- RETANN = (RETCAP*0.13147) + annual O&M costs
- NEWANN = (NEWCAP*0.13147) + annual O&M costs

The capital recovery factor, 0.13147, is based on a ten percent interest rate and a fifteen year period. Estimates of annual O&M costs are listed separately in this file.

It is possible to set RETCAP=0 when RETANN is greater than zero. It is also possible to set NEWCAP=0 when NEWANN is greater than zero. This means that there is an annual O&M expense associated with the control option, but there is no capital cost.

NEWANN may equal NEWCAP*0.13147; RETANN may equal RETCAP*0.13147. In these cases, it is assumed that the control option requires a capital expense, but it does not require additional O&M costs.

When L = 1, the user may edit the parameter value for EMRT, but the revised estimate must still represent the uncontrolled emission rate and the cost data must still be set equal to zero. When L = 2, the value for EMRT must be less than its value when L = 1. Similarly, when L = 3, the value for EMRT must be less than its value when L = 2 and so on.

A listing of this file is presented in Appendix B.

SECTION 7

THE PROMPT INPUT DATA FILES

The PROMPT model requires two input data files in order to run. The first of these files is RUNOPTS.DAT, which contains the default run-time options. The second file is one of the four fuel demand scenarios.

The four fuel demand scenarios files are provided in a compressed format that enables PROMPT to load the information in approximately fifteen seconds. In addition to the projected fuel demand data, each of the four fuel demand scenario files contains:

- Forecasted sulfur dioxide and sulfate emissions for sulfur processing plants (exogenous assumptions)
- Forecasted smelter SO_2 and sulfate emissions (exogenous assumptions)
- Calculated fraction of energy use which belongs to each state within a Federal region for each emission source group
- Uncontrolled emission rates, controlled emission rates and costs of various controls for each fuel type and emission source group

The four scenarios may be identified by their DOS file names:

- LOWNAPAP.DAT: NAPAP 1985 Low Fuel Price/Economic Growth Rate
- REFNAPAP.DAT: NAPAP 1985 Reference (Moderate) Fuel Price/Economic Growth Rate
- HINAPAP.DAT: NAPAP 1985 High Fuel Price/Economic Growth Rate
- NAPAP86.DAT: 1986 EEA Middle Oil Price Case

The user does not need to type in these file names since PROMPT has a built in feature that will handle scenario selection. However, for PROMPT to work correctly both the appropriate energy demand file and the RUNOPTS.DAT file must be on the default drive.

SECTION 8

POTENTIAL OPERATING PROBLEMS WITH THE PROMPT MODEL

Although the PC version of the PROMPT model has been designed to detect errors and to provide opportunities for correction, there are certain problems that may still be encountered. Here is a short list of problems with some suggested solutions:

- Execution speed.
  - On a machine with a 8087 math co-processor chip the maximum run time is approximately twenty five-minutes. On an IBM PS/2 with a math chip, the run time is less than 2 minutes.
- When reading data files the model suddenly stops and prints an obscure error message.
  - The most likely difficulty is that the energy demand data file has been damaged. Make a new copy of the appropriate file from the original distribution diskette.
- The model stops and prints an End-of-File error message
  - The error message will refer to a specific file. Most likely this file has been damaged. Make a new copy of this file from the original distribution diskette.
- The model runs to completion but many of the numbers in the result tables are extremely large, extremely small, "indefinite", or "undefined."
  - The most likely difficulty is that the data files have been damaged. Make a new copy of the appropriate energy demand file from the original distribution diskette. Alternatively, it is possible that user changes in the cost data, the emission rate estimates, or the total fuel demand (OPTIONS 12 and 13) have caused the model to behave unpredictably. Since PROMPT does not screen user entries for these values, it is the user's responsibility to verify that the new numbers are reasonable.

APPENDIX A

Sample Outputs from PROMPT

Sample OUTEMISR.DAT

PROCESS MODEL PROJECTION TECHNIQUE

PROJECTIONS OF INDUSTRIAL NON-BOILER EMISSIONS
VERSION 3.0 AS OF JULY 1988

ENERGY SCENARIO: LOW1985.CMP
EMISSION TYPE: LOW NOX

DEVELOPED FOR:

U.S. ENVIRONMENTAL PROTECTION AGENCY

IN COOPERATION WITH

THE NATIONAL ACID PRECIPITATION ASSESSMENT PROGRAM

DEVELOPED BY:

ENERGY AND ENVIRONMENTAL ANALYSIS, INC.
1655 N. FORT MYER DRIVE
ARLINGTON, VIRGINIA 22209

CAUTION
1980 DATA ARE EEA ESTIMATES, NOT NAPAP ESTIMATES
1985 ESTIMATES ARE PROJECTIONS, NOT NAPAP ESTIMATES

CONTROL SCENARIO:

NITROGEN DIOXIDE EMISSIONS

STOCK PURCHASED AFTER 1995 IS CONSTRAINED BY

90.000UNIFORM REDUCTION %

ALL OTHER STOCK IS CONSTRAINED AFTER 1995 BY

90.000UNIFORM REDUCTION %

XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX

* * * * * YEAR = 1980 * * * * *

TOTAL NOX EMISSIONS BY EMISSION SOURCE GROUP IN 10**3 SHORT TONS PER YEAR

FED REG	HI T RECUP	LO T RECUP	GLASS	CEMENT	TURBINES	FBC S	OTHER	TOTAL
1	0.	3.	2.	16.	1.	0.	17.	38.
2	0.	7.	5.	41.	1.	0.	29.	83.
3	0.	26.	10.	80.	4.	0.	72.	191.
4	0.	24.	11.	139.	2.	0.	111.	288.
5	0.	46.	12.	115.	6.	0.	159.	338.
6	0.	41.	13.	117.	12.	0.	275.	458.
7	0.	7.	6.	51.	3.	0.	36.	103.
8	0.	4.	2.	17.	0.	0.	27.	50.
9	0.	28.	8.	55.	5.	0.	59.	156.
10	0.	11.	1.	22.	0.	0.	32.	67.
TOTAL	0.	198.	70.	652.	34.	0.	819.	1773.

* * * * * YEAR = 1985 * * * * *

TOTAL NOX EMISSIONS BY EMISSION SOURCE GROUP IN 10**3 SHORT TONS PER YEAR

FED REG	HI T RECUP	LO T RECUP	GLASS	CEMENT	TURBINES	FBC S	OTHER	TOTAL
1	0.	4.	2.	12.	2.	0.	18.	39.
2	1.	14.	5.	30.	2.	0.	26.	77.
3	4.	32.	9.	56.	5.	0.	59.	165.
4	3.	56.	15.	108.	4.	0.	116.	302.
5	9.	66.	12.	83.	11.	0.	144.	325.
6	2.	107.	17.	85.	33.	0.	231.	475.
7	1.	15.	5.	35.	3.	0.	33.	93.
8	0.	4.	2.	11.	0.	0.	24.	43.
9	2.	49.	10.	40.	19.	0.	59.	179.
10	2.	15.	1.	18.	0.	0.	30.	66.
TOTAL	24.	365.	78.	477.	79.	0.	740.	1764.

* * * * * YEAR = 1990 * * * * *

TOTAL NOX EMISSIONS BY EMISSION SOURCE GROUP IN 10**3 SHORT TONS PER YEAR

FED REG	HI T RECUP	LO T RECUP	GLASS	CEMENT	TURBINES	FBC S	OTHER	TOTAL
1	2.	6.	2.	11.	3.	0.	19.	43.
2	6.	19.	5.	26.	3.	0.	25.	84.
3	19.	37.	10.	50.	6.	0.	57.	180.
4	14.	68.	16.	97.	5.	0.	120.	320.
5	45.	75.	13.	72.	13.	0.	139.	358.
6	13.	173.	18.	73.	54.	0.	222.	552.
7	3.	19.	6.	31.	3.	0.	42.	103.
8	3.	5.	3.	10.	0.	0.	25.	45.
9	9.	70.	11.	36.	37.	0.	65.	229.
10	7.	17.	1.	16.	0.	0.	32.	73.
TOTAL	121.	488.	87.	421.	124.	0.	747.	1987.

* * * * * YEAR = 1995 * * * * *

TOTAL NOX EMISSIONS BY EMISSION SOURCE GROUP IN 10**3 SHORT TONS PER YEAR

FED REG	HI T RECUP	LO T RECUP	GLASS	CEMENT	TURBINES	FBC S	OTHER	TOTAL
1	2.	8.	2.	10.	5.	0.	20.	48.
2	11.	21.	5.	24.	4.	0.	25.	90.
3	39.	36.	10.	45.	5.	0.	61.	196.
4	23.	75.	17.	89.	5.	0.	125.	333.
5	91.	74.	14.	68.	13.	0.	142.	402.
6	20.	218.	20.	68.	69.	2.	210.	607.
7	5.	20.	6.	28.	2.	0.	34.	95.
8	6.	5.	3.	9.	0.	0.	30.	53.
9	16.	81.	11.	34.	58.	0.	64.	265.
10	11.	17.	2.	14.	0.	0.	33.	77.
TOTAL	225.	553.	91.	390.	162.	3.	743.	2166.

* * * * * YEAR = 2000 * * * * *

TOTAL NOX EMISSIONS BY EMISSION SOURCE GROUP IN 10**3 SHORT TONS PER YEAR

FED REG	HI T RECUP	LO T RECUP	GLASS	CEMENT	TURBINES	FBC S	OTHER	TOTAL
1	1.	8.	2.	7.	2.	0.	8.	28.
2	9.	16.	4.	16.	1.	0.	4.	51.
3	35.	25.	8.	30.	1.	1.	14.	114.
4	20.	57.	13.	56.	2.	1.	63.	211.
5	76.	53.	11.	45.	4.	1.	32.	222.
6	17.	170.	15.	44.	23.	7.	61.	337.
7	4.	14.	4.	19.	1.	0.	7.	50.
8	6.	3.	2.	6.	0.	0.	5.	22.
9	14.	78.	9.	24.	28.	0.	9.	162.
10	10.	11.	1.	9.	0.	0.	16.	47.
TOTAL	190.	437.	68.	256.	63.	11.	219.	1244.

* * * * * YEAR = 2010 * * * * *

TOTAL NOX EMISSIONS BY EMISSION SOURCE GROUP IN 10**3 SHORT TONS PER YEAR

FED REG	HI T RECUP	LO T RECUP	GLASS	CEMENT	TURBINES	FBC S	OTHER	TOTAL
1	1.	12.	2.	6.	2.	0.	9.	32.
2	9.	20.	5.	16.	1.	1.	5.	58.
3	42.	30.	9.	30.	1.	2.	22.	137.
4	22.	57.	16.	51.	1.	2.	69.	218.
5	86.	63.	13.	46.	2.	2.	41.	255.
6	20.	166.	18.	42.	18.	24.	61.	348.
7	4.	14.	5.	19.	0.	1.	7.	51.
8	7.	3.	2.	7.	0.	0.	6.	25.
9	16.	86.	11.	25.	24.	1.	10.	174.
10	12.	11.	1.	8.	0.	0.	18.	49.
TOTAL	219.	462.	83.	251.	50.	35.	247.	1347.

* * * * * YEAR = 2020 * * * * *

TOTAL NOX EMISSIONS BY EMISSION SOURCE GROUP IN 10**3 SHORT TONS PER YEAR

FED REG	HI T RECUP	LO T RECUP	GLASS	CEMENT	TURBINES	FBC S	OTHER	TOTAL
1	1.	14.	2.	6.	1.	0.	9.	34.
2	10.	23.	6.	17.	1.	2.	6.	63.
3	45.	31.	10.	30.	1.	3.	27.	147.
4	24.	60.	17.	49.	1.	3.	70.	224.
5	94.	71.	14.	47.	2.	3.	48.	279.
6	20.	160.	19.	41.	14.	33.	61.	349.
7	5.	14.	6.	20.	0.	2.	7.	53.
8	7.	3.	2.	7.	0.	0.	6.	26.
9	17.	90.	12.	26.	19.	2.	10.	176.
10	12.	10.	1.	7.	0.	1.	18.	49.
TOTAL	234.	476.	90.	250.	39.	49.	263.	1400.

* * * * * YEAR = 2030 * * * * *

TOTAL NOX EMISSIONS BY EMISSION SOURCE GROUP IN 10**3 SHORT TONS PER YEAR

FED REG	HI T RECUP	LO T RECUP	GLASS	CEMENT	TURBINES	FBC S	OTHER	TOTAL
1	1.	17.	2.	6.	1.	0.	9.	36.
2	9.	23.	6.	17.	1.	2.	7.	64.
3	44.	31.	11.	31.	1.	3.	31.	152.
4	24.	60.	16.	46.	1.	3.	70.	220.
5	96.	75.	14.	48.	2.	4.	54.	292.
6	20.	154.	21.	39.	11.	36.	61.	341.
7	4.	14.	6.	20.	0.	2.	7.	54.
8	7.	4.	2.	7.	0.	0.	7.	28.
9	16.	83.	13.	27.	14.	2.	11.	167.
10	12.	9.	1.	6.	0.	1.	17.	47.
TOTAL	234.	470.	92.	249.	30.	53.	273.	1402.

APPENDIX B

Estimates of Emission Rates
and
Air Pollution Control Costs

------ GRP=SX COK OVEN FUEL=OTHER FUELS ----------

LEVL	EMRT	RETANN	NEWANN	RETCAP	NEWCAP
1	0.07	0	0	0	0

-------- GRP=SX CEMENT FUEL=NAT'L GAS ----------

LEVL	EMRT	RETANN	NEWANN	RETCAP	NEWCAP
1	1.8	0	0	0	0

----- GRP=SX CEMENT FUEL=LOW SULFUR OIL ----------

LEVL	EMRT	RETANN	NEWANN	RETCAP	NEWCAP
1	2.7	0.0	0.0	0	0
2	2.2	0.2	0.2	0	0

----- GRP=SX CEMENT FUEL=LOW SULFUR COAL ----------

LEVL	EMRT	RETANN	NEWANN	RETCAP	NEWCAP
1	2.7	0.0	0.0	0	0
2	2.2	0.2	0.2	0	0

----- GRP=SX CEMENT FUEL=HIGH SULFUR OIL ----------

LEVL	EMRT	RETANN	NEWANN	RETCAP	NEWCAP
1	5.0	0.00	0.00	0	0
2	2.7	0.07	0.07	0	0
3	2.2	0.20	0.20	0	0

-------- GRP=SX CEMENT FUEL=OTHER FUELS ----------

LEVL	EMRT	RETANN	NEWANN	RETCAP	NEWCAP
1	2.7	0.0	0.0	0	0
2	2.2	0.2	0.2	0	0

-------- GRP=SX RECOVERY FUEL=BIOMASS ----------

LEVL	EMRT	RETANN	NEWANN	RETCAP	NEWCAP
1	0.2	0	0	0	0

------- GRP=SX REFINING FUEL=NAT'L GAS ----------

LEVL	EMRT	RETANN	NEWANN	RETCAP	NEWCAP
1	2.2	0.00	0.00	0.0	0.00
2	0.2	0.48	0.45	0.8	0.62

---- GRP=SX REFINING FUEL=HIGH SULFUR OIL ----------

LEVL	EMRT	RETANN	NEWANN	RETCAP	NEWCAP
1	2.2	0.00	0.00	0.0	0.00
2	0.2	0.48	0.45	0.8	0.62

---- GRP=SX REFINING FUEL=DISTILLATE OIL ----------

LEVL	EMRT	RETANN	NEWANN	RETCAP	NEWCAP
1	2.2	0.00	0.00	0.0	0.00
2	0.2	0.48	0.45	0.8	0.62

------ GRP=SX REFINING FUEL=OTHER GASES ----------

LEVL	EMRT	RETANN	NEWANN	RETCAP	NEWCAP
1	2.2	0.00	0.00	0.0	0.00
2	0.2	0.48	0.45	0.8	0.62

------ GRP=SX REFINING FUEL=OTHER FUELS ----------

LEVL	EMRT	RETANN	NEWANN	RETCAP	NEWCAP
1	2.2	0.00	0.00	0.0	0.00
2	0.2	0.48	0.45	0.8	0.62

---- GRP=SX AGGLOMERATION FUEL=NAT'L GAS ----------

LEVL	EMRT	RETANN	NEWANN	RETCAP	NEWCAP
1	1.6	0	0	0	0

--- GRP=SX AGGLOMERATION FUEL=HIGH SULFUR OIL ---------

LEVL	EMRT	RETANN	NEWANN	RETCAP	NEWCAP
1	1.6	0	0	0	0

-- GRP=SX AGGLOMERATION FUEL=LOW SULFUR COAL ----------

LEVL	EMRT	RETANN	NEWANN	RETCAP	NEWCAP
1	1.6	0	0	0	0

---- GRP=SX AGGLOMERATION FUEL=OTHER FUELS ----------

LEVL	EMRT	RETANN	NEWANN	RETCAP	NEWCAP
1	1.6	0	0	0	0

----- GRP=SX OTHERS FUEL=LOW SULFUR OIL ----------

LEVL	EMRT	RETANN	NEWANN	RETCAP	NEWCAP
1	0.90	0.00	0.00	0	0
2	0.70	0.12	0.12	0	0
3	0.50	0.24	0.24	0	0
4	0.35	0.36	0.36	0	0

----- GRP=SX OTHERS FUEL=LOW SULFUR COAL ----------

LEVL	EMRT	RETANN	NEWANN	RETCAP	NEWCAP
1	1.3	0.0	0.0	0	0
2	1.1	0.2	0.2	0	0

----- GRP=SX OTHERS FUEL=HIGH SULFUR OIL ----------

LEVL	EMRT	RETANN	NEWANN	RETCAP	NEWCAP
1	2.30	0.00	0.00	0.00	0.00
2	1.80	0.10	0.10	0.00	0.00
3	1.50	0.24	0.24	0.00	0.00
4	1.20	0.36	0.36	0.00	0.00
5	0.90	0.48	0.48	0.00	0.00
6	0.23	0.66	0.62	1.26	0.98

---- GRP=SX OTHERS FUEL=HIGH SULFUR COAL ----------

LEVL	EMRT	RETANN	NEWANN	RETCAP	NEWCAP
1	2.5	0.00	0.00	0.00	0.00
2	1.3	0.07	0.07	0.00	0.00
3	1.1	0.20	0.20	0.00	0.00
4	0.3	0.82	0.78	1.26	0.98

----- GRP=SX OTHERS FUEL=DISTILLATE OIL ----------

LEVL	EMRT	RETANN	NEWANN	RETCAP	NEWCAP
1	0.15	0	0	0	0

------- GRP=SX OTHERS FUEL=OTHER GASES ----------

LEVL	EMRT	RETANN	NEWANN	RETCAP	NEWCAP
1	0.23	0	0	0	0

------ GRP=NX HI T RECUP FUEL=NAT'L GAS ----------

LEVL	EMRT	RETANN	NEWANN	RETCAP	NEWCAP
1	3.20	0.00	0.000	0.000	0.000
2	2.24	0.01	0.004	0.071	0.028

--- GRP=NX HI T RECUP FUEL=LOW SULFUR OIL ----------

LEVL	EMRT	RETANN	NEWANN	RETCAP	NEWCAP
1	3.40	0.00	0.000	0.000	0.000
2	2.44	0.01	0.004	0.071	0.028

--- GRP=NX HI T RECUP FUEL=DISTILLATE OIL ----------

LEVL	EMRT	RETANN	NEWANN	RETCAP	NEWCAP
1	3.20	0.00	0.000	0.000	0.000
2	2.24	0.01	0.004	0.071	0.028

------ GRP=NX LO T RECUP FUEL=NAT'L GAS ----------

LEVL	EMRT	RETANN	NEWANN	RETCAP	NEWCAP
1	0.72	0.00	0.000	0.000	0.000
2	0.50	0.01	0.004	0.071	0.028

--- GRP=NX LO T RECUP FUEL=LOW SULFUR OIL ----------

LEVL	EMRT	RETANN	NEWANN	RETCAP	NEWCAP
1	0.88	0.00	0.000	0.000	0.000
2	0.66	0.01	0.004	0.071	0.028

--- GRP=NX LO T RECUP FUEL=LOW SULFUR COAL ---------

LEVL	EMRT	RETANN	NEWANN	RETCAP	NEWCAP
1	1.24	0	0	0	0

--- GRP=NX LO T RECUP FUEL=HIGH SULFUR OIL ---------

LEVL	EMRT	RETANN	NEWANN	RETCAP	NEWCAP
1	1.04	0.00	0.000	0.000	0.000
2	0.88	0.01	0.004	0.071	0.028

--- GRP=NX LO T RECUP FUEL=DISTILLATE OIL ----------

LEVL	EMRT	RETANN	NEWANN	RETCAP	NEWCAP
1	0.72	0.00	0.000	0.000	0.000
2	0.50	0.01	0.004	0.071	0.028

--------- GRP=NX GLASS FUEL=NAT'L GAS ----------

LEVL	EMRT	RETANN	NEWANN	RETCAP	NEWCAP
1	0.80	0.000	0.000	0.000	0.000
2	0.68	0.002	0.000	0.014	0.000
3	0.56	0.015	0.004	0.114	0.028

------ GRP=NX GLASS FUEL=LOW SULPHUR OIL ----------

LEVL	EMRT	RETANN	NEWANN	RETCAP	NEWCAP
1	0.97	0.000	0.000	0.000	0.000
2	0.83	0.002	0.000	0.014	0.000
3	0.70	0.015	0.004	0.114	0.028

------- GRP=NX GLASS FUEL=DISTILLATE OIL ----------

LEVL	EMRT	RETANN	NEWANN	RETCAP	NEWCAP
1	0.80	0.000	0.000	0.000	0.000
2	0.68	0.002	0.000	0.014	0.000
3	0.56	0.015	0.004	0.114	0.028

--------- GRP=NX CEMENT FUEL=NAT'L GAS ----------

LEVL	EMRT	RETANN	NEWANN	RETCAP	NEWCAP
1	4.200	0.000	0.000	0.000	0.000
2	3.336	0.002	0.000	0.014	0.000
3	2.940	0.015	0.004	0.114	0.028

------ GRP=NX CEMENT FUEL=LOW SULPHUR OIL ----------

LEVL	EMRT	RETANN	NEWANN	RETCAP	NEWCAP
1	2.0	0.000	0.000	0.000	0.000
2	1.6	0.002	0.000	0.014	0.000
3	1.4	0.015	0.004	0.114	0.028

----- GRP=NX CEMENT FUEL=LOW SULPHUR COAL ----------

LEVL	EMRT	RETANN	NEWANN	RETCAP	NEWCAP
1	1.20	0.000	0.000	0.000	0.000
2	0.96	0.002	0.000	0.014	0.000
3	0.84	0.015	0.004	0.114	0.028

------ GRP=NX CEMENT FUEL=DISTILLATE OIL ----------

LEVL	EMRT	RETANN	NEWANN	RETCAP	NEWCAP
1	2.0	0.000	0.000	0.000	0.000
2	1.6	0.002	0.000	0.014	0.000
3	1.4	0.015	0.004	0.114	0.028

-------- GRP=NX CEMENT FUEL=OTHER FUELS ----------

LEVL	EMRT	RETANN	NEWANN	RETCAP	NEWCAP
1	1.20	0.000	0.000	0.000	0.000
2	0.96	0.002	0.000	0.014	0.000
3	0.84	0.015	0.004	0.114	0.028

------- GRP=NX TURBINES FUEL=NAT'L GAS ----------

LEVL	EMRT	RETANN	NEWANN	RETCAP	NEWCAP
1	0.413	0.00	0.00	0.000	0.00
2	0.290	0.03	0.02	0.200	0.13
3	0.120	0.08	0.07	0.232	0.16

---- GRP=NX TURBINES FUEL=LOW SULFUR OIL ----------

LEVL	EMRT	RETANN	NEWANN	RETCAP	NEWCAP
1	0.65	0.00	0.00	0.00	0.00
2	0.46	0.03	0.02	0.20	0.13
3	0.30	0.08	0.07	0.25	0.16

---- GRP=NX TURBINES FUEL=DISTILLATE OIL ----------

LEVL	EMRT	RETANN	NEWANN	RETCAP	NEWCAP
1	0.413	0.00	0.00	0.000	0.00
2	0.290	0.03	0.02	0.200	0.13
3	0.120	0.08	0.07	0.232	0.16

------ GRP=NX TURBINES FUEL=OTHER GASES ----------

LEVL	EMRT	RETANN	NEWANN	RETCAP	NEWCAP
1	0.41	0.00	0.00	0.000	0.00
2	0.29	0.03	0.02	0.200	0.13
3	0.12	0.08	0.07	0.232	0.16

--- GRP=NX FBC HEATERS FUEL=LOW SULFUR COAL ---------

LEVL	EMRT	RETANN	NEWANN	RETCAP	NEWCAP
1	0.3	0	0	0	0

--- GRP=NX FBC HEATERS FUEL=HIGH SULFUR COAL --------

LEVL	EMRT	RETANN	NEWANN	RETCAP	NEWCAP
1	0.3	0	0	0	0

--- GRP=NX OTHERS FUEL=NAT'L GAS ---

LEVL	EMRT	RETANN	NEWANN	RETCAP	NEWCAP
1	0.20	0.000	0.000	0.000	0.000
2	0.17	0.002	0.000	0.014	0.000
3	0.15	0.015	0.004	0.114	0.028
4	0.02	0.760	0.690	1.790	1.430

--- GRP=NX OTHERS FUEL=LOW SULPHUR OIL ---

LEVL	EMRT	RETANN	NEWANN	RETCAP	NEWCAP
1	0.42	0.000	0.000	0.000	0.000
2	0.38	0.002	0.000	0.014	0.000
3	0.48	0.015	0.004	0.114	0.028
4	0.04	0.760	0.690	1.790	1.430

--- GRP=NX OTHERS FUEL=LOW SULPHUR COAL ---

LEVL	EMRT	RETANN	NEWANN	RETCAP	NEWCAP
1	0.64	0.000	0.000	0.000	0.000
2	0.54	0.002	0.000	0.014	0.000
3	0.48	0.015	0.004	0.114	0.028
4	0.06	0.820	0.750	1.850	1.480

----- GRP=NX OTHERS FUEL=HIGH SULPHUR OIL ----------

LEVL	EMRT	RETANN	NEWANN	RETCAP	NEWCAP
1	0.440	0.000	0.000	0.000	0.000
2	0.400	0.002	0.000	0.014	0.000
3	0.370	0.015	0.004	0.114	0.028
4	0.044	0.760	0.690	1.790	1.430

----- GRP=NX OTHERS FUEL=HIGH SULPHUR COAL ----------

LEVL	EMRT	RETANN	NEWANN	RETCAP	NEWCAP
1	0.64	0.000	0.000	0.000	0.000
2	0.54	0.002	0.000	0.014	0.000
3	0.48	0.015	0.004	0.114	0.028
4	0.06	0.820	0.750	1.850	1.480

------ GRP=NX OTHERS FUEL=DISTILLATE OIL ----------

LEVL	EMRT	RETANN	NEWANN	RETCAP	NEWCAP
1	0.19	0.000	0.000	0.000	0.000
2	0.17	0.002	0.000	0.014	0.000
3	0.16	0.015	0.004	0.114	0.028
4	0.02	0.760	0.690	1.790	1.430

---------- GRP=NX OTHERS FUEL=BIOMASS ----------

LEVL	EMRT	RETANN	NEWANN	RETCAP	NEWCAP
1	0.15	0	0	0	0

---------- GRP=NX OTHERS FUEL=LPG ----------

LEVL	EMRT	RETANN	NEWANN	RETCAP	NEWCAP
1	0.19	0	0	0	0

------- GRP=NX OTHERS FUEL=OTHER GASSES ----------

LEVL	EMRT	RETANN	NEWANN	RETCAP	NEWCAP
1	0.20	0.000	0.000	0.000	0.000
2	0.17	0.002	0.000	0.014	0.000
3	0.15	0.015	0.004	0.114	0.028
4	0.02	0.760	0.690	1.790	1.430